APPARATUS AND METHOD FOR INTERACTIVE 3D REGISTRATION OF ULTRASOUND AND MAGNETIC RESONANCE IMAGES BASED ON A MAGNETIC POSITION SENSOR

ABSTRACT OF THE DISCLOSURE

Intraoperative ultrasound (US) is integrated with stereotactic systems, where a system interactively registers two-dimensional (2D) US and three-dimensional (3D) magnetic resonance (MR) images. The registration is based on tracking a US probe with a DC magnetic position sensor. A transformation algorithm is performed to transform coordinates of points between two different spaces, where MR and US image spaces are independently registered with the position sensor space and where coordinate points can be registered between the MR and US spaces. A calibration procedure can be performed, and a phantom can be used to determine and analyze registration errors. The registered MR images can reconstructed using either zero-order or first-order interpolation.

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